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ABSTRACT

The Western Wisconsin Communications Cooperative (WWCC) was established in 1973 to develop and implement a county-wide, multi-service, broadband, interactive, telecommunications system to enhance the quality of rural life. Eight school districts adopted the system's concept and signed a 15 year lease agreement with WWCC. Funds were procured from the Farm Home Administration for system construction, with a grant from the Kellogg Foundation providing resources for equipment placed in each school, and for technical assistance from four universities of the West Central Wisconsin Consortium. Construction began in 1978, was completed in 1980, and includes: three microwave towers to transmit signals throughout the country; 133 miles of cable which interconnect 9 communities and 8 school districts; a 4.6 meter Scientific Atlanta earth station antenna; intra-school dissemination (all schools have an internal distribution system compatible with the external cable system); two-way transmission capabilities for all schools (allows schools to share staff and facilities to expand educational offerings); and originating receiving equipment (furnished by the Kellogg Foundation). The system also provides opportunities for curriculum and staff development, staff inservice, programs for handicapped or gifted, as well as social services, security systems, and recreational entertainment for rural citizens. (AH)

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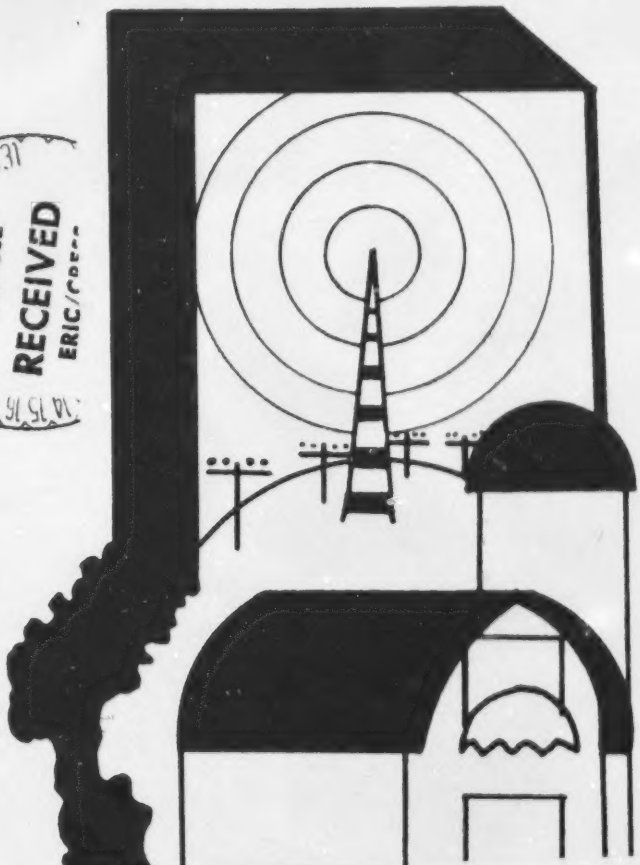

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

TREMPEALEAU COUNTY KELLOGG PROJECT:

A Rural Telecommunications Service System

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WHO

- Residents of Trempealeau County
- Eight School Districts (LEA's) and County Extension Office
- Western Wisconsin Communications Cooperative (WWCC), a Trempealeau Co. Cooperative
- West Central Wisconsin Consortium (WCWC) - Four University of Wisconsin Campuses: Eau Claire, La Crosse, River Falls, Stout
- W. K. Kellogg Foundation, Inc., Battle Creek, MI

WHAT

- Broadband Communications System.
  - County-wide, multi-service, audio and video capabilities.
  - Two-way interactive telecommunications.
- Commercial and local television system for county residents, including an earth station.
- State network educational television services - Minnesota and Wisconsin.
- Community services: social, recreational, cultural, security, health, emergency, etc.

WHEN

- WWCC formed on 12/17/73.
- Kellogg phase began on January 1, 1977.
- System became operational on July 26, 1979.
- Construction completed on March 13, 1980.

WHERE

- Trempealeau County, Wisconsin

WHY

- To improve and enhance the quality of life in rural areas.
- To provide alternative delivery systems for education and community services.
- To more effectively utilize the local community resources.
- To provide better services to residents of rural areas.
- To provide a wider range of educational & service opportunities.
- To promote greater participation in educational and related community activities.

HOW

- Western Wisconsin Communications Cooperative (WWCC)
  - Commitment for a long term (15 year) loan of $1,446,000 from the Farmers Home Administration through the Rural Development Act of 1972.

- W. K. Kellogg Foundation, Battle Creek, Michigan
  -A four year grant for $510,170 awarded to UW-Stout for professional service & assistance.

Historical Overview

The basic objective of the project was to plan, develop and implement a county-wide, multi-service, broadband, interactive, telecommunications system to enhance the quality of rural life.

Trempealeau County is a rural county, located in West Central Wisconsin, with a population of approximately 25,000. Arcadia is the largest community in the county with 2,159 residents; and Whitehall, the county seat, has 1,486 residents. The county is approximately 26 miles wide and 62 miles long. Farming, light manufacturing, and small business provide the majority of employment in the area. Its rural nature can best be described as a county without any parking meters or traffic lights and one where there are more cows than people.

The Trempealeau County Telecommunication system has been highlighted as a unique effort in a study conducted by the U.S. Congress, Office of Technological Assessment, on "The Feasibility and Value of a Broadband Communication in Rural Areas." This report noted the project as a potential forerunner of the establishment of Rural Telecommunication Systems similar to the Rural Electrification systems which were established in the 1930's. Specifically noted was the reference to the project as a "unique effort and the success or failure of the project will have significant implications for other similar endeavors by other rural communities."

The overall project planning and achievements were the results of numerous individuals and agencies working together towards the development and establishment of this concept. Historically, it can be highlighted as follows:

Dec. 17, 1973:	Western Wisconsin Communications Cooperative (WWCC) established.
Jan. 23, 1974:	General plans drafted and Rural Development Act loan requested from the Farmers Home Administration (FmHA).
June 7, 1974:	FmHA conditionally approves the WWCC loan proposal provided the 23 conditions are met.
July 28, 1975:	Eight school districts adopt the concept of the system at their annual meetings and adopt a 15-year lease agreement with the WWCC.
May 18, 1976:	Wisconsin State Statute [120.13(22)] changed to allow long-term lease agreements for Wisconsin School Districts.
Sept. 2, 1976:	W. K. Kellogg Foundation from Battle Creek, Michigan, approves a grant application of $510,170.
Jan. 1, 1977:	Kellogg phase of the project began involving the Cooperative, eight LEAs, and the four universities of the West Central Wisconsin Consortium (WCWC).
Feb. 15, 1978:	Nine community City Councils/Village Boards accept a cable television franchise.
Nov. 15, 1978:	Construction of the system began, with American Electronic Laboratories as the contractor.
Nov. 15, 1978:	Farmers Home Administration loan to the Cooperative approved ($1,466,000).
July 26, 1979:	First TV signal delivered on the system to a WWCC Cooperative subscriber.
Dec. 10, 1979:	First two-way interactive television transmission between two schools.
March 13, 1980:	System completed and accepted by WWCC.

The commitments of the eight school district school boards, the school superintendents and their respective staffs, and the WWCC Board of Directors have been most significant in the development of the project. But, probably the most important factor was the grant from the W. K. Kellogg Foundation, Inc. which assured that the project would become a reality. The resources received from the Foundation enabled the WWCC to maintain its planning and development process while the conditions of the FmHA loan were being met. It also provided the necessary resources for the school districts and the four universities to plan and develop a program for alternative applications of the system.

The equipment purchased through the Kellogg Project, and provided to the schools, enabled each school district to become a television programming origination point. In addition, staff training was also accomplished through these resources. The overall project coordination in the developmental stage was a critical process, and its achievements would not have been accomplished without this significant support--therefore, the reference as the "Trempealeau County - Kellogg Project."

☆☆

Technical Overview

The Western Wisconsin Communications Cooperative (WWCC) has constructed an interactive cable television/ microwave system to serve the residents of Trempealeau County, Wisconsin. The system consists of a 54-300 MHz forward and a 5-30 MHz reverse single trunk, single-feeder, cable television distribution system with a three terminus microwave facility capable of handling all bidirectional information.

Of the 36 channels available on the system, 18 channels are in use at the present time. Ten entertainment channels are being offered to WWCC subscribers and the remaining eight channels provide a full two-way cable television service between the eight rural school districts. These schools each have a channel assigned for their exclusive use.

The WWCC system is owned and operated by its cooperative members and presently consists of 133 miles of trunk cable for its television system. It operates under Federal Communications Commission (FCC) Certificate of Compliance numbers WI 0169 through WI 0177 and FCC FML microwave relay permits numbered WCU-981, WCU-982 and WCC-275.

A diagram showing the microwave and cable paths for the WWCC system is shown on the last page of this booklet. This diagram indicates a local television origination point at each of the eight high schools. Therefore, each school district has the means to share staff and facilities to expand educational offerings by using two-way television.

At each of the three tower sites, four channels, of the 18 presently available, are received "off-air." The remaining 14 channels are received at the Strum and Galesville towers, via microwave, from the Whitehall tower.

The WWCC system has a Scientific Atlanta 4.6-meter satellite receiving earth station antenna which presently brings in: WGN (Chicago), WTBN (Atlanta), the Movie Channel, and the Entertainment and Sports Programming Network. Inasmuch as additional channel space is available on the WWCC system, further services will be offered in the near future.

The system also provides a link from the Trempealeau County Courthouse, to the system headend at the Whitehall Tower, where it is converted to Channel 13 and cablecast throughout the WWCC system.

Access to the WWCC system is guaranteed through a 15-year lease agreement which each of the eight school districts, the University of Wisconsin, and the Trempealeau County University Extension Office, have with the WWCC.

Full two-way cable service is provided, on the WWCC system, to the school districts of: Arcadia, Blair, Whitehall, Osseo, Independence, Taylor, Eleva-Strum, and Galesville. These schools are located within respective communities, with the exception of Strum, which is located midway between Eleva and Strum. The Trunk Cable serving these schools has full two-way modules installed. Amplifiers "downstream," (or further from the headend) from the schools are unidirectional, although they are capable of full two-way operation via the installation of "upstream" module components.

In a brief summary, the following is a listing of viewer services that are not available to the residents of Trempealeau County:

YOUR SET CHANNEL	BROADCAST CHANNEL	TELEVISION STATION	CITY	PROGRAMMING
2	2	KTCA	Minneapolis	Educational
3	None	WARNER	New York	Movie Channel
4	9	WGN	Chicago, IL	Independent
5	None	ESPN	New York	Sports Only
6	17	WTBS	Atlanta, GA	Independent
7	11	WTCN	Minneapolis	NBC
8*	None	Local	Future Programming	
9	19	WXOW	LaCrosse	ABC
10	13	WEAU	Eau Claire	NBC
11	8	WKBT	LaCrosse	CBS
12	31	WHLA	LaCrosse	Educational
13*	None	Local	Future Programming	

* These two channels are being reserved for local program origination of services of local interests. Channel 8 is tentatively being planned as the local Community Bulletin, and Channel 13 will serve the area as the county extension channel for health, social, recreational, cultural, and special interest services eminating from the County Courthouse.

Achievements and Accomplishments

The initial premise, "To Enhance the Quality of Rural Life," serves as the foundation in the overall planning and development of the project. It was originally stated by the system founders that "to achieve the additional reception of a few more commercial television channels would basically be a waste of time." In this context, the emphasis was, and still is, to develop a total communications system to serve the needs of rural county residents. This system, if developed to its full potential, could revitalize rural life and provide the necessary education, social, cultural, and economic advantages for the rural sector of our society.

The achievements and accomplishments can be summarized as follows:

- School District Unity: The cooperative and and systematic planning by the eight school districts serving county residents and the surrounding area can be directly attributed to the project activities. Eight original school districts working is indicative of the project impact.

- WCWC Cooperation: The involvement of four universities, basically located on the perimeter of Trempealeau County and providing leadership and support for this rural project is a unique identity of the project's significance. The prominent role and function of the four universities has led to a major impact on the developments, and does provide for unique contribution to the alternatives that the telecommunication system could provide to the educational and service dimension of higher education institutions (Universities of Wisconsin at La Crosse, Eau Claire, River Falls, and Stout).

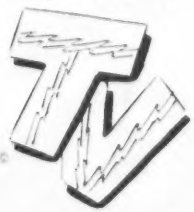
- Wisconsin State Statutes: The change of a Wisconsin Statute, allowing school districts to enter into long-term contractual lease agreements, for cable service, was achieved.

- Common Franchise: Nine communities in Trempealeau County have adopted a common franchise for the county-wide cooperative (WWCC) to operate the system in their communities.

- FmHA Loan: The first and only FmHA loan for cable television made through the Rural Development Act of 1972 could serve as a "model" for other cable television loans awarded in the future to rural areas which are administered by the U.S. Department of Agriculture.

- Demonstrations Calendar: All eight school districts with assistance from the WCWC institutions participated in 24 demonstrations on the applications of the telecommunications system for administrative, instructional, and student activity areas. The demonstrations were planned by two school districts, with each district assuming 3 primary (leadership) and 3 supportive roles. This provided the opportunity for staff interest and ingenuity to emerge on the application of the system to enhance their respective areas of responsibility. Programs conducted in Social Problems, Arts and Crafts, Guidance, Advanced Math, Foreign Language, Forensics, Home Economics, have all reflected high interest and positive feedback from students, teachers, and administrators.

- Social Service/County Courthouse Base: The Trempealeau County Board of Supervisors, with leadership from the project staff, committed resources and facilities to provide an originating facility within the Courthouse for social service/county based programs. An area of the courthouse was designated and remodeled to serve as a studio and the County Extension Office is coordinating the delivery of health, social, and county extension services via the telecommunication system. The UW-La Crosse applied for and received a television equipment grant from the National Telecommunications and Information Administration (NTIA) to provide the television originating equipment from the Courthouse setting.



- Construction Completed: The overall system, as proposed in the initial phase, was completed and accepted by the WWCC on March 13, 1980. This included:
  - Microwave towers: The erection of three microwave towers to transmit the signal throughout the county.
  - Cable System: 133 miles of cable interconnect the nine communities and the eight school districts. This provides services to the residents and schools located in the communities and to any rural resident living along the interconnecting trunk line.
  - Earth Station: A 4.6 meter Scientific Atlanta earth station antenna was incorporated into the system and was installed in December of 1979. The service adds the Atlanta and Chicago superstations, a movie channel and the entertainment and sports programming network for county subscribers.
  - Intra-School Dissemination: Based on local school assessment, each school district has determined the extent of the internal television distribution capabilities of the system. These schools are providing each classroom with a receiving and originating capability. All schools have an internal distribution system directly compatible with the external cable system.
  - Two-way Transmission: All eight school districts have the capability of interaction. This enables one school to communicate with any one, or all eight schools, via the system via the two-way interactive system.
- Originating and Receiving Equipment: Kellogg project resources provided each school with an equipment package which provided for local program origination capabilities. The in-school equipment is owned and maintained by the school district. After a technical assessment, equipment was selected which would meet the versatility of the system and be the responsibility of the WWCC.
- George Stoney Humanistic Communications Award: The project was recognized for its efforts with the receipt of the George Stoney Award from the National Federation of Local Cable Programmers. This award was made at their National Convention held in Madison, Wisconsin, in September of 1979 and the inscription noted: "For Outstanding Achievement in Bringing Two-Way Cable Television to Schools and Rural Communities.

- National Public Service Satellite Conference in Washington, DC: The project was singled out as one of three projects in the nation which were highlighted as having future national impact.

- Curriculum/Staff Development: Extensive curriculum development and staff inservice has been conducted at each school district. Emphasis was concentrated on the areas of reviewing and revising curriculum areas and to stress staff inservice on the application of the system for instructional purposes. Nearly all teachers have been given basic inservice on the use of the equipment and the potential application of the system for instruction and service areas.

- Rural/Community Subscribers: As of May 1, 1980, 1100 residents have subscribed to the service. With the currently constructed system, the WWCC has a potential of 3600 subscribers. This system provides reception for rural residents who were, in some cases, previously limited to one or two television channels.

- Extension of the Telecommunication System: With the first phase of the project constructed, the planning and development for the second phase has been undertaken. A loan application has been submitted to the Rural Electrification Administration of the U.S. Department of Agriculture to extend the system an additional 350 miles. This extension would provide service to the smaller unincorporated population centers and would offer cable television to an additional 4,000 rural residents.

- Evaluation and Needs Assessment: An ongoing evaluation and needs assessment process has been established which provides feedback from students, teachers, administrators, and community representatives in various aspects of the project. Initial feedback provided information on local perspectives of the proposed system. Since then the ongoing assessment process is monitoring the activities initiated and conducted on a county-wide basis.

PROJECTIONS AND IMPLICATIONS

The basic telecommunication system will continue to provide commercial and public television services to the residents of Trempealeau County. The comprehensive county-wide system, including the earth station, will provide unprecedented service to the residents of the rural County which will be comparable to cable television services available to any urban area in the country.

The uniqueness of the system, the two-way interactive telecommunication system between the eight school districts, the local program originating capability, and the local social and recreational services via the system are the critical challenge areas. The capabilities and applications of the system have been frequently referenced as "being limited only by the imaginations of the users." The technology is now available and the application of the technology to more effectively, efficiently, and extensively utilize the system becomes the real challenge. Initiating local communication systems and exploring educational and social programs effect only a small potential of the system. The following are some of the projections that are being proposed and some of the implications the system may have to resolve in order to enhance the rural development:

- Educational Staff Inservice: Rural school systems, with relatively small (sometimes one person) departments, and/or one teacher per grade level, cannot establish and maintain meaningful inservice programs. However, with eight school districts interconnected with the two-way telecommunications system, the resources of all eight schools will be available to effectively plan and utilize the system to enhance the professional development of staff.

- Staffing Patterns: Coordination of curriculum programs will provide the application of alternative staffing patterns to maximize the expertise of individual staff members. Team teaching, lead/master teacher, mediated instruction, staff exchanges, and other alternatives need to be investigated and evaluated to utilize the available staffing expertise most effectively.

- Expanding Curriculum Opportunities: Each school in Trempealeau County has the potential to access the curriculum offerings available in all eight school districts. This enables schools with limited curriculum alternatives to provide a comprehensive program for their students. Establishing common times and mechanism for local staff support and instructional evaluation systems will be some of the issues that need to be resolved. In addition, the potential of vocational-technical schools and university type courses, that could be "fed" into the system as special enrichment type programs for interested students and, in reality, bring the realm of any curriculum need to the student, needs to be explored. Limitation of resources and program planning will need to be extensively reviewed for feasible applications of the system.

- Teaching and Learning Styles: The range of technological alternatives will provide the opportunity to explore the most effective teaching and learning procedures by disciplines, grade levels, and staff interests and expertise. Programs ranging from a system-wide presentation to individualized and/or small group interaction within and/or between any of the school districts present a wide range of alternatives to meet the individual student learning styles and to most effectively utilize the staff expertise by applying the individual teaching styles of the teachers. Teaching strategies, new and unique methods and techniques will need to be explored to utilize the system to enhance the teaching and learning process.

- Target Populations: Special needs of identified groups of students could be resolved via the use of the system. The needs of the handicapped and special interest groups which could utilize the system for relatively small numbers in isolated situations, or for special programs (short-term) for large group instruction covers a wide range of possibilities. This could also include the "home-bound" students for interim intervals or on an extended basis.

- Gifted and Talented: Small schools with limited fiscal and material resources and with fewer total numbers of gifted and talented students are hard pressed to provide challenging and comprehensive programs for their gifted and talented. The need exists to design and implement special programs to challenge and encourage the development of gifted and talented students in these schools.

- Enhancement of Existing Curriculum: Staff interaction between schools, administrative planning and cooperation, sharing material resources and teaching and learning experiences, should establish a significant impact on the basic instructional and administrative systems of each district. The staff use of the telecommunications system within their respective interest and competent areas, will interject an unknown element of motivation and attitudinal development which should have a positive effect on the teaching and learning process.

- Assessing Program Effectiveness: Time alone will disclose the benefits derived from the applications of the system. The assessment of the basic premise, which was the "enhancement of the quality of rural life" on a county-wide basis and its major projections and implications need to be determined. With no other similar system for comparison, the assessment of the "quality of rural life," will be a challenge as applied to the educational, social, cultural, economic, and recreational components among all age groups in the county. Evidence of the social, cultural and recreational elements are relevant, just from the expansion of commercial and public television broadcasting services that have been made available to county residents. The implications of the educational, social service, and economic programs cannot be so readily identified. The development of a meaningful longitudinal assessment design will be one of the major challenges that needs to be projected. These implications can be very significant for the further developments of the existing system, as well as for the replication of the system in other rural counties.

- Utilization of Community Resources: With television program origination capabilities at each school district, and at the county courthouse, the range of area resources becomes the boundaries of the school districts. This does not preclude the exclusion of state, national and international resources, as the earth station ties the world's resources to the residents of Trempealeau County. However, the local system has the advantages of utilizing community resources to reinforce and expand the program capabilities for any sectors of the educational, adult, social, etc., programs being developed at the local level. The design and implementation of these programs will be another area of developing community unity in establishing programs with local resources to better meet local needs.

- Community Services: In addition to the commercial television systems, the interjection of locally originated community programs for hospitals, nursing homes, senior citizen homes and the general public will also challenge the planners for the utilization of the system. Local athletic events, concerts, local government meetings, community/county polls, special interest groups seminars and workshops can all be planned and disseminated to any and all areas of the county; e.g., volunteer firemen training on new techniques in first aid.

- Adult/Continuing Education: Societal expectations are constantly being challenged with the dynamics of our current society. Technological and economic factors are some of the ongoing issues which prompt the need for establishing alternative applications of the system to meet the educational/training needs of all members of our society. Developing programs that range from extensive long-term professional studies to short-term intensive workshop/conference type training will be a challenge for the application of the system. Alternative modes of delivery and/or instruction will need to be designed to effectively meet the needs of the total spectrum of an adult population. Special programs for doctors and lawyers, technical skill training for the factory worker, information sessions on new trends in farming, to special interest programs for leisure and/or personal needs will need to be designed and implemented. Teleconferencing, video discs, home video systems, satellites, cable systems (two-way) are all commonly available technologies which provide unlimited alternatives for the needs of the adult learner.

- Computer/Digital Systems: With frequent reference that there is little doubt that the ability to use computers will soon be judged as a BASIC SKILL, the need exists to consider the use of the system as a common carrier of computer services to all sectors in the county. Educational systems, county/community governments, business establishments, and farmers all have the need for this common technology. Yet, it is basically impossible to anticipate individual small, economically based, units to be established and provide access to a meaningful computer support system. With a common carrier, a centrally based time-sharing computer will provide the potential for individual units to have access to computer services. Terminal costs, with direct access to a common time-sharing computer can be economical and functional considerations for another significant application of the existing telecommunication system.

- School Support Personnel--Bus Drivers, Custodians, Cooks, Clerical, Accountants, Teacher-Aids, etc.: A critical component of all school systems, and yet one which receives limited consideration for "inservice/professional training," is the area of support personnel for schools and/or community/public systems. Just as changes and improvements occur in the educational and technical fields, corresponding changes occur in the areas of support personnel. The same basic problem of planning effective small school teacher inservice programs exist for the support personnel. The system must consider planning staff development activities relative to their areas of responsibilities. The telecommunication system provides just another application and utilization of the program to enhance the effectiveness of the support personnel.

- Administrative Alternatives: Common systems have common problems and common needs. Hopefully, cooperative planning can resolve some of these common problems and needs. Inservice planning, use of consultants, problem solving, technological assessments and applications, long-range planning, curriculum alternatives, community services, flexible programming, sharing materials, etc., are just some of the issues that the county-wide system could help to resolve.

- Security Systems: With basically all business and community establishments connected to the system, and eventually, a majority of the residents, the need exists to plan and implement an ongoing monitoring system for theft, fire, vandalism, etc.

- Career Information: The application of the system as an information dissemination vehicle has another unlimited dimension. Career information from the bases of opportunities, training requirements, projected employment, alternatives for employment, etc., are sources of information which can be assembled and easily disseminated to schools and/or resident viewers.

- Educational Alternatives: The versatility of the system provides the opportunity to design alternative educational and learning environments to meet specific needs. It must be recognized that education is a continuum process from the earliest years to the final evolution of wisdom in the old age. Learning and growth can and should continue as a cooperative/collaborative process in the total community and for all age groups. We must recognize that the ultimate education forces are not the schools and colleges, but they are our work, our communities, our families and our media. The media aspect of Trempealeau County is especially significant in planning alternatives as we apply the technological capabilities of the system to meet societal needs. The communication technology provides the learning opportunities to be extended to literally everyone in the county, at every age and basically, in every circumstance of life, and the challenge of the project will be to meet those individual needs.

Written By

Ray Szymanski, 1981

PROPOSED MICROWAVE AND CABLE PATHS FOR WWCC SYSTEM

LOCATION

Trempealeau County, located in West Central Wisconsin, is a predominantly rural area with an approximate population of 25,000. Arcadia is the largest community, with a population of 2,159. Whitehall, the county seat, has a population of 1,486.

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